INDIVIDUAL ASSIGNMENT 1ST ITERATION

1.1 Concepts, definition, and history of interaction with AI and autonomous systems

History of AI

As Grudin highlights, the term artificial intelligence (AI) was first used in 1956 in relation to a workshop written by John McCarthy (Grudin, 2009, p.48). However, as also discussed in the article, artificial intelligence was around before it first was conceptualized as artificial intelligence. Already during the second world war, we saw examples of artificial intelligence with the codebreaking machine of Alan Turing (Grudin, 2009, p. 49). I believe that this is an example of how AI came from making models based on biology, and human behavior.

Definition of AI

As mentioned above, John McCarthy was the first to use the term artificial intelligence and defines AI as:

> "the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable" (McCarthy, 1998, p.2).

McCarthy distinguishes AI from not only being related to human intelligence, but rather something that involves studying the problems presented to intelligence by the world. In contrast Tone Bratteteig and Guri Verne defines AI as following:

> "AI is a subfield of computer science aimed at specifying and making computer systems that mimic human intelligence or express rational behavior, in the sense that the task would require intelligence if executed by a human." (Bratteteig & Verne, 2018, p.1).

With this definition, we understand AI and human intelligence as something more correlated, rather than McCarthy. A similar definition is by Oracle which states that

"artificial intelligence refers to systems or machines that mimic human intelligence to perform tasks and can iteratively improve themselves based on the information they collect (Oracle, 2022). Based on this I would define AI as the science to develop machines that can learn on their own to become more intelligent over time, in many cases simulating human intelligence.

Similarities and differences between human autonomy and machine autonomy

Thrun talks about robotic autonomy as "a robot's ability to accommodate variations on its environment" (2004, p.14). Personally, I would say that robotic autonomy is more manipulated by the user. In contrast with human autonomy, where we are freer to decide our own ethical values and self-determination, to an extent of course.

When talking about something being automatic, I imagine a process that is working by itself, at least as much as possible, without human help. Something being autonomous, I would define as more capable of dealing with its surroundings and working by itself for an extended period. For example, you could push a tell robot to start walking and it would start moving its legs and move across the floor automatically, however, if it also understands that there is an object in front of me and shifts direction it would be understood as mot autonomous.

Article: Ironies of Automation

The article by Bainbridge (1982) is looking into how automation of industrial processes in some cases can lead to expanding problems rather than eliminating them. I chose this article because I found it quite interesting reading about how we are trying to replace human labor with AI but are ending up with humans having to supervise the automated systems and therefore creating a paradox (Bainbridge, 1982, p. 129).

In the second half of the article, several solutions to how we can solve the problems regarding the paradox are presented. Because as Bainbridge states:

> "There will always be a substantial human involvement with automated systems because criteria other than efficiency are involved, e.g. when the cost of automating some modes of operation is not justified by the value of the product, or because the

> public will not accept high-risk systems with no human component" (Bainbridge, 1982, p. 133).

I think this article shows that AI is not always the cheapest and most efficient solution, at least not like it is today. A lot of the automated processes are not automated enough and is still requiring humans to monitor.

AI company

I chose to investigate the Norwegian AI company Simplifai. Their value proposition is "We offer AI solutions in the form of Digital Employees" (Simplifai, 2022). The plug-in-play solution automates the task of translating many unstructured emails and documents between businesses and industries. Further, they advertise this solution to reduce operating costs by 50% and increase efficiency by six times.

Documentary about AI

For this part, I have chosen the documentary *Peter 2.0: the human cyborg* (NRK, 2020). Peter Scott-Morgan had a Ph.D. in robotics, wrote books about robotics, and was a scientist. He believed that any problem could be solved if you were smart enough and had access to cool technology. Therefore, when he got diagnosed with motor neuron disease (MND) he decided to start working towards a solution that could keep him alive despite his illness. He turned himself into the first human guinea pig to see how far we can turn humans into a science fiction world. Slowly he was becoming part human and part computer.

This documentary challenges the idea of what it means to be human – and with his project and new technology, it is a part of redefining the term human and its meaning. He was increasingly turning into a full cyborg. And by adding more and more AI he would turn into a full cyborg. However, Peter said himself that he is never going to stop being a human, but rather challenge the meaning of what it means to be a human.

What I also found quite interesting with this documentary, was how the term interface was now tubes that connect to computers. For example, he got one tube that fed him intravenously, one that got rid of waste, and a bunch of other tubes reading his mind so this could be communicated to others around him. They worked on making an artificial

voice, with the goal of it sounding exactly like Peter. In this way, his personality would still be preserved by the time he would lose his ability to talk. Even though Peter died in June (2022), his way of thinking is interesting to reflect on because this might be a contemporary way to fight motor neuron disease or other diseases.

1.2 Robots and AI systems

The origin of robots

There is some disagreement about when the word robot was first used. Some believe that it originates from the role play RUR in 1920 by the Czech playwright Karel Capek (Adelaide Robotics Academy, 2022). However, there are some that believe it was Karel's older brother, Josef Capek, who first used the word in his short story Opilec in 1917. But the Capek brothers Society in Prague, claims that this is not correct, the word used was "automat" (Adelaide Robotics Academy, 2022). Despite the debate about which brother used the term first, I think we can conclude with it descended from the Capek family around 1920 in central Europe.

Definition of a Robot

Sebastian Thrun presents different definitions of a robot. Firstly, there is the definition from 1979 by the Robot Institute of America that defines a robot as:

> "A programmable, multifunctional manipulator designed to move materials, parts, tools, or specialized devices through various programmed motions for the performance of a variety of tasks" (Thrun, 2004, p.11).

I think this definition is describing a specific type of robot, but not robots in general. Personally, it reminds me of industrial robots that are designed to move materials parts, and tools. I think a robot could be much more beyond that.

Secondly, Thrun presents the definition from 1993 by Merriam Webster that says robots are "An automatic device that performs functions normally ascribed to humans or a machine in the form of a human" (Thrun, 2004, p.11). In contrast to the first definition, this one is more general in what a robot does. However, I also think this only describes some specific robots and not robots in general. For example, I don't think robots

necessarily need to be like humans, just take the robotic lawnmower as an example of this. Based on the two definitions presented I would define robots as a physical object that is programmed to interact with their physical surroundings. I don't think it's necessary to define its looks or specific tasks, since there are so many different types of robots.

The relation between AI and Robots

Personally, I find it difficult to distinguish AI and robots a lot of the time. This might be because I often think of robots as something based on AI. However, this is not always the case. For me, one of the elements distinguishing AI from robots is that it does not come in a physical form. If it appears as physical, it is often through robots. Therefore, you can have a robot without AI and AI without the robot.

Beyond their appearance, I also believe that intelligence is different from robots and AI. Robots like Paro that are programmed to do something, in this case, make cuddling sounds and movements do not necessarily understand why it does it. However, a chatbot might have a better understanding that the user wants to know more about this therefore I will provide information about it.

Paro – how a robot moves

Paro is a therapeutic robot that is most used in elderly care. The robot proved to lower stress, anxiety, and pain and help against depression for senior citizens with dementia (Paroseal, 2022). Later the robot has shown results among other "patient" groups, for example, children and adolescents with developmental disorders. Paro is designed to look like a lifelike seal and responds with emotions and gestures. The robot is most known for being cuddled by dementia patients. You can have the robot on your lap, pet it, and the robot will react by moving its head, tail, and eyes and making sounds.

1.3 Universal design and AI systems

Universal design

The Norwegian ministry of children and equality wrote in their action plan on how to have Norway universally designed by 2025 that: "Universal design is an expression of a value put on equality by society" (2009). For me, universal design could be accomplished

by facilitating something to be usable, accessible, and inclusive. Universal design with respect for inclusion would therefore be to make something that is accessible for everyone despite the situation.

Potential of AI and its ways of being inclusive and exclusive

It can be difficult to understand the exact goal behind some technology. I think Siri could be an example of trying to include more users by making text input "easier" and more efficient, but in many cases end up excluding users based on language or pronunciation. Another example could be chatbots that don't really understand if you have untraditional or complex questions. The user's struggles to describe could potentially exclude them from getting help. Therefore, I would say that the goal of AI often is to make something more efficient and simpler. However, in some cases, this is not always the case. Sometimes, by using AI we extend the gap between expectations and user's input.

The concepts understand and understanding

I think that robots can understand their tasks, for example in a way that if X = A the robot understands that Y = B. However, I don't think the robot understands why it's like that – they just know it must be like that. In one way this could be understood as a way of calculating in the sense Bratteteig and Verne describe that "machines cannot reason, only calculate" (2019, p.2).

1.4Guideline for Human-AI interaction

I chose to look at guideline 11 from Microsoft "Make clear why the system did what it did". This could be seen in relation to one of Schneiderman's eight rules "offer informative feedback" (Microsoft, 2022). Even though they both focus on feedback, they could be different from each other in the way that the guideline from Microsoft focuses more on the technical aspect and explaining the system, rather than focusing on the user's interaction like the one of Schneiderman. Like what Grudin discusses with how AI focused on the algorithms and improving this, we focus on the interaction and user experience when talking about HCI (Grudin, 2009, p.48).

1.5 References

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